

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Patent Application of:)
APPLICANT	: Minoru Mukaida)
SERIAL NO.	: 09/740,345)
FILED	: December 18, 2000)
FOR	: ENERGY)
CONSUMPTION EFFICIENCY)
IMPROVING AGENT AND)
METHOD, AND ARTICLE HAVING)
IMPROVED ENERGY)
CONSUMPTION EFFICIENCY)
ART UNIT	: 1773)
EXAMINER	: Rickman, Holly C.)
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April 26, 2006

Commissioner for Patents
Alexandria, VA 22313-1450

Amendment and Response under 37 C.F.R. § 1.111

Sir:

In response to the Official Action dated December 7, 2005, please amend the above-identified application as follows. A request for a two (2) month extension of time accompanies this response.

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO CLAIMS

Claims 1-27 (canceled)

28. (currently amended) An article with improved energy consumption efficiency, comprising a contact surface and a flexible film formed thereon, the film being substantially liquid and having a thickness of 0.01 to 10 μm and a viscosity of 100,000 cp or less, the film containing antislipping agents, the antislipping agents consisting of fine particles of an average particle diameter of 10 μm or less, the film comprising a flexible polymer binder selected from the group consisting of polyethylene; a methyl, phenyl, chloro, hydroxy, acetoxy, or cyano derivative of polyethylene; polybutadiene; a methyl or chloro derivative of polybutadiene; a copolymer of said polyethylene derivative and said butadiene derivative; silicone; polysulfide; polyurethane; modified silicone; modified epoxy resin; and modified acrylic resin; wherein the article is a rubber tire.

29. (currently amended) The article of claim 28, wherein at least a portion of the antislipping agent is partially exposed throughout a surface of the film, regardless of whether the film has been brought into direct contact with another surface.

30. (previously presented) The article according to claim 28, wherein the antislipping agent is mainly comprised of at least one chosen from the group consisting of silicon oxide, aluminum oxide, cerium oxide, silicon carbide, and a finely particulate organic material.

31. (previously presented) The article of claim 28 wherein the viscosity of said film is 10,000 to 100,000 cp.

32. (previously presented) The article of claim 31 wherein said viscosity is 10,000 to 50,000 cp.

33. (previously presented) The article of claim 32 wherein said viscosity is 10,000 to

20,000 cp.

34. (previously presented) The article of claim 28 wherein the thickness of the film is 0.01 to 1 μm .

35. (previously presented) The article of claim 34, wherein said thickness is 0.01 to 0.1 μm .

36. (previously presented) The article of claim 28 wherein said average particle diameter is 10 nm to 10 μm .

37. (previously presented) The article of claim 36 wherein said diameter is 10 nm to 1 μm .

38. (previously presented) The article of claim 37 wherein said diameter is 10 to 100 nm.

39. (withdrawn) A method of improving energy consumption efficiency of a contact surface, comprising the steps of, in order:

preparing an energy consumption efficiency improving agent by

selecting a flexible polymer binder from the group consisting of (a) polyethylene; a methyl, phenyl, chloro, hydroxy, acetoxo, or cyano derivative of polyethylene; polybutadiene; a methyl or chloro derivative of polybutadiene; a copolymer of said polyethylene derivative and said butadiene derivative; and (b) precursors of the following: silicone; polysulfide; polyurethane; modified silicone; modified epoxy resin; and modified acrylic resin; the binder having a viscosity of 100,000 cp or less;

selecting a solvent from the group consisting of methyl alcohol, denatured ethyl alcohol, isopropyl alcohol, propyl alcohol, acetic acid and cyclohexane;

diluting the binder with an amount of the solvent so that a resulting mixture has a viscosity of 100 cp or less;

applying the energy consumption efficiency improving agent to the contact surface as a film having a thickness of 10 μm or less;

in a case where the binder is selected as a precursor of group (b), effecting a condensation action on the film with an external substance; and

effecting an evaporation or dissolution of the solvent such that the film has a viscosity of 100,000 cp or less.

40. (withdrawn) The method of claim 39, further comprising the step of:

prior to the applying step, adding to the energy consumption efficiency improving agent an antislipping agent, the antislipping agent consisting of fine particles of an average particle diameter of 10 μm or less.

41. (withdrawn) The method of claim 40, wherein at least a portion of the antislipping agent is partially exposed throughout a surface of the film.

42. (withdrawn) The method of claim 39 wherein the viscosity of said mixture due to the presence of solvent is 20 to 100 cp.

43. (withdrawn) The method of claim 42 wherein said viscosity is 20 to 50 cp.

44. (withdrawn) The method of claim 43 wherein said viscosity is 20 to 35 cp.

45. (withdrawn) The method of claim 44 wherein said external substance is water.

46. (withdrawn) The method of claim 45 wherein said solvent is isopropyl alcohol.

47. (withdrawn) The method of claim 39, wherein said mixture contains 1.42 to 1.58 wt. % of said flexible polymer binder and 94.81 to 98.5 wt. % of said solvent.

REMARKS

Claims 28 and 29 have been amended. Claims 28-47 are presently pending, of which claims 39-47 have been withdrawn from consideration.

EXAMINER'S ACTION

Claims 28-38 stand rejected as being obvious over Craven in view of *Polymer Science*. Without admitting that the original and supplemental Declarations do not show unexpected results for a film layer with antislipping agents having an average particle size of less than 10 microns, and furthermore confirming that the characteristics of the compositions used in the experiments described in the Declarations are the same as those in Example 1 (see specification at page 19, lines 18-22), claim 28 has been amended to clarify what is the claimed invention and expedite prosecution of this application. Claim 28, as amended, and claims 29-38, which depend directly or indirectly from claim 28, are patentable over Craven in view of *Polymer Science* for the reasons set forth below.

Claim 28, as amended, requires, in relevant part, that the film, which contains particles of antislipping agents having a diameter of 10 microns or less and is formed on the contact surface of the article, is "flexible" and "substantially liquid" and, furthermore, comprises a "flexible" polymer binder. The inventive "flexible film", being "nearly liquid", "will not perfectly harden during its life" (see specification at page 12, line 19-page 13, line 4; page 16, lines 9-18; and page 17, line 18-20), so as to advantageously provide that the film is "very difficult to be peeled off and exhibits an energy consumption efficiency improving effect for a surprising long period of time." (See specification at page 18, lines 12-27).

In contrast to the claimed invention, the film of Craven is not flexible and, as acknowledged by the Examiner, will be removed (worn away) when placed in contact with a (road) surface. (See Craven, Col. 3, ln. 13-15). Nowhere does Craven teach or suggest the "flexible" and "substantially liquid" film, as required by claim 28, and furthermore *Polymer Science* does not cure the deficiencies of Craven.

Accordingly, claim 28 is patentable over the cited references.

In addition, amended claim 29, which depends from claim 28, recites that at least a portion of the antislipping agent is partially exposed throughout a surface of the film "regardless of whether the film has been brought into direct contact with another surface." (See specification, page 16, lines 10-18). In the Official Actions dated March 1 and June 2, 2004, the Examiner admitted that Craven does not explicitly teach that the particles in the film are partially exposed. The Examiner explained that the particle of Craven would be exposed as the film wears down, thereby acknowledging that whether a portion of the Craven particle is partially exposed from the film is a result effective variable. Thus, the Examiner admitted that Craven nowhere teaches or suggests that a portion of at least one antislipping agent of a film is always exposed, as required by claim 29, which means that the exposure of a portion of an antislipping agent of the claimed film is not a result effective variable. Although the particles of the Craven film may eventually become exposed as the film wears down based on contact (use), Craven does not describe, or teach or suggest one skilled in the art to provide, a film having at least a portion of a particle always exposed, so as to improve adhesion and energy consumption efficiency of the film. Accordingly, claim 29 is patentable over Craven.

Further, claims 30-38, which depend directly or indirectly from claim 28, are also

patentable for the same reasons as set forth above with respect to claim 28 and because of the further restrictions they add.

Accordingly, claims 28-38 are not obvious over the cited art and withdrawal of the Section 103 rejection is, therefore, respectfully requested.

CONCLUSION

For the foregoing reasons, it is believed that all of the claims, as presently presented, are patentable.

The Examiner is invited to telephone the undersigned if it is believed that further amendment and/or discussion would help to advance the prosecution of the present application.

Reconsideration and allowance of claims 28-38 are, therefore, respectfully requested.

Respectfully submitted,

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